WHAT IS CLAIMED IS:

1. An apparatus for adaptive prediction playout of a talkspurt, the talkspurt comprising a series of packets received by the apparatus, the apparatus comprising:

a buffer for buffering received packets of the talkspurt where each packet has a latency time in the buffer;

a LMS predictor using a Least Means Square algorithm for calculating a predicted next packet arrival interval after receiving each packet of the talkspurt to predict when a next packet will be received; and

a constant bit rate player for playing out the packets in the buffer at a substantially constant rate;

whereby the packet having the greatest latency in the buffer is discarded when the predicted next packet arrival interval is less than a draining threshold so that the latency of the packets in the buffer is controlled.

2. The apparatus of claim 1, wherein the constant bit rate player starts to play out the packets in the buffer on first occurrence of one of the number of packets in the buffer exceeding a predefined buffer threshold and the packet in the buffer having the greatest latency exceeding a predefined maximum acceptable playout latency.

3. The apparatus of claim 1 or 2, wherein calculating predicted next packet arrival intervals comprises:

(a) selecting an initial set of prediction filter coefficients $w(l)$ where $l = 0, 1, ..., p-1$ at the start of the talkspurt;

(b) calculating one predicted next packet arrival interval $x^\wedge(n+1)$ after receiving an n-th packet using prediction equation

$$\hat{x}(n+1)=\sum_{l=0}^{p-1} w(l)x(n-l)$$ where $x(n)$, $x(n-1)$, $x(n-2)$, ..., $x(n-p+1)$ denotes a series of p received packet arrival intervals;

(c) receiving the next packet and measuring the next packet arrival interva $x(n+1)$;

(d) calculating a prediction filter coefficient $w(n+1)$ for $x(n+1)$ from the least mean square error of the difference between $x(n+1)$ and $x^\wedge(n+1)$;

(e) updating the prediction equation $x^\wedge(n+1)$ in step (b) by adding $w(n+1)$ and deleting the $w(p-1)$ and incrementing n by one for calculating the predicted next packet arrival interval; and

(f) repeat (b) to (e) after receiving each packet until the talkspurt ends.

4. The apparatus of claim 3, wherein the prediction filter coefficient $w(n+1)$ for $x(n+1)$ is calculated from the least mean square error of the difference between $x(n+1)$ and $x^*(n+1)$ with a weighting function to reduce the effect of the next packet arrival interval $x(n+1)$ as compared to earlier packet arrival intervals.

5. The method of claim 4, wherein the prediction filter coefficient $w(n+1)$ is $w(n) + \mu e(n)X(n)$ where $e(n)$ is $x(n+1)$ less $x^*(n+1)$, $X(n)$ is $[x(n), x(n-1), \ldots x(n-p+1)]^T$, and μ is a predefined step size for adjusting prediction error $e(n)$ and which μ is in the range

$1 < 1/\mu < 2/\lambda_{max}$, where λ_{max} is the maximum eigenvalue of $\mathbf{R}_X$, where $\mathbf{R}_X$ is the autocorrelation of the vector x.

6. The method of claim 5, wherein the prediction filter coefficient $w(n+1)$ calculated from a normalized least mean square algorithm where

$$w(n+1) = w(n) + \frac{\mu e(n) X(n)}{\|X(n)\|^2} \text{ and } \|X(n)\|^2 = X(n)^T X(n)$$

7. A method of adaptive prediction playout of a talkspurt, the talkspurt comprising a series of packets as received, the method comprising:

buffering received packets of the talkspurt where each packet has a latency in the buffer;

using a Least Means Square algorithm for calculating a predicted next packet arrival interval after receiving each packet of the talkspurt to predict when a next packet will be received; and

playing out the packets in the buffer at a substantially constant rate;

whereby the packet having the greatest latency in the buffer is discarded when the predicted next packet arrival interval is less than a draining threshold so that the latency of the packets in the buffer is controlled.

8. The method of claim 7, wherein the constant bit rate player starts to play out the packets in the buffer on first occurrence of one of the number of packets in the buffer exceeding a predefined buffer threshold and the packet in the buffer having the greatest latency exceeding a predefined maximum acceptable playout latency.

9. The method of claim 7 or 8, wherein calculating predicted next packet arrival intervals comprises

(a) selecting an initial set of prediction filter coefficients $w(l)$ where $l = 0, 1, \ldots, p-1$ at the start of the talkspurt;

(b) calculating one predicted next packet arrival interval $x^*(n+1)$ after receiving an n-th packet using prediction equation

$\hat{x}(n+1)=\sum_{l=0}^{p-1} w(l)x(n-l)$ where $x(n)$, $x(n-1)$, $x(n-2)$, ..., $x(n-p+1)$ denotes a series of p received packet arrival intervals;

(c) receiving the next packet and measuring the next packet arrival interval $x(n+1)$;

(d) calculating a prediction filter coefficient $w(n+1)$ for $x(n+1)$ from the least mean square error of the difference between $x(n+1)$ and $x^*(n+1)$;

(e) updating the prediction equation $x^*(n+1)$ in step (b) by adding $w(n+1)$ and deleting the $w(p-1)$ and incrementing n by one for calculating the predicted next packet arrival interval; and

(f) repeat (b) to (e) after receiving each packet until the talkspurt ends.

10. The apparatus of claim 9, wherein the prediction filter coefficient $w(n+1)$ for $x(n+1)$ is calculated from the least mean square error of the difference between $x(n+1)$ and $x^*(n+1)$ with a weighting function to reduce the effect of the next packet arrival interval $x(n+1)$ as compared to earlier packet arrival intervals.

11. The method of claim 10, wherein the prediction filter coefficient $w(n+1)$ is $w(n)$ + $\mu e(n)X(n)$ where $e(n)$ is $x(n+1)$ less $x^*(n+1)$, $X(n)$ is $[x(n), x(n-1), \ldots x(n-p+1)]^T$, and μ is a predefined step size for adjusting prediction error $e(n)$ and which μ is in the range

$1<1/\mu<2/\lambda_{max}$, where λ_{max} is the maximum eigenvalue of $\mathbf{R}_X$ where $\mathbf{R}_X$ is the autocorrelation of the vector x.

12. The method of claim 11, wherein the prediction filter coefficient $w(n+1)$ calculated from a normalized least mean square algorithm where

$$\mathbf{w}(n+1) = \mathbf{w}(n) + \frac{\mu e(n) X(n)}{\|X(n)\|^2} \text{ and } \|X(n)\|^2 = X(n)^T X(n)$$